WHAT IS CLAIMED IS:

1. An AC electric motor comprising a stator and a rotor journalled for rotation about an axis relative to the stator, the rotor having an electrically continuous conductive loop, the loop having longitudinal portions spaced from and generally parallel to the axis and shunt portions extending between the ends of the longitudinal portions, the stator having at least two separate windings angularly displaced from one another about the axis of the rotor, an electrical circuit for selectively energizing and de-energizing the field windings with separate AC currents to develop an AC magnetic field vector that moves around the rotor axis, the field windings and conductive loop being arranged so that the AC magnetic field vector induces an AC current in the conductive loop and the reluctance of the loop operates to develop torque on the rotor that tends to cause it to rotate in synchronization with the movement of the magnetic field vector.

2. An electric motor as set forth in claim 1, wherein the field windings comprise 3 or more coils distributed about the rotor axis.

3. An AC motor as set forth in claim 2, including a circuit arranged to energize successive ones of said windings in a constant angular direction around said rotor axis while de-energizing angularly preceding ones of said windings.

4. An AC motor as set forth in claim 3, wherein said circuit provides an AC square wave for powering said windings.

5. An AC motor as set forth in claim 3, wherein said circuit is arranged to provide an AC voltage waveform and to change the characteristics of said waveform to vary the speed or torque of the motor.

6. An AC motor as set forth in claim 1, wherein said field windings comprise first and second windings, said second winding being oriented to produce a magnetic field vector at right angles to the magnetic field vector of the first winding, said electric circuit being arranged to modulate the currents in said windings to produce a resultant magnetic field vector that is positioned about the axis of the rotor.

7. An AC motor as set forth in claim 1, wherein said circuit is arranged to control the position of the magnetic field vector in relation to the rotor to regulate speed or torque.

8. An AC motor as set forth in claim 1, wherein the rotor has a plurality of pairs of conductive loops and the windings are arranged to produce magnetic field vectors that pass through the space of the rotor in chordal-like zones.

9. An electric motor comprising a stator and a rotor, field windings on the stator for producing an AC magnetic field with a vector at successive angular positions around the axis of rotation of the motor when the windings are

successively energized with single phase AC power, the rotor having a construction by which it increases the reluctance in the magnetic field when it has an angular orientation out of alignment with the magnetic field vector compared to its reluctance when it is aligned with the magnetic field vector whereby the rotor seeks to rotate in synchronization with the magnetic field vector produced by the field windings.

11 ~~10~~. A controller circuit for an AC motor comprising a plurality of switches and/or amplifiers that generate separate power signals at respective outputs, each power signal having an AC frequency common with the other signals, the signals varying in amplitude in a cyclic manner corresponding to the speed of rotation of the rotor of the motor.

12 ~~11~~. A method of operating an electric motor having a stator and a rotor which includes causing an AC magnetic field vector to be displaced around the axis of the rotor by sequentially energizing field windings on the stator and providing the rotor with a construction that has a variable reluctance in the magnetic field whereby the rotor turns with the movement of the magnetic field vector because its reluctance in the magnetic field decreases when it is aligned in a particular orientation with the magnetic field vector.

13 ~~12~~. A method of converting electrical energy to mechanical energy comprising the steps of assembling a rotor and stator in a manner enabling the rotor to rotate about an axis relative to the stator, providing field windings on the stator capable of producing an AC magnetic field vector in

the rotor, providing the rotor with a reluctance that varies with its angular orientation relative to the AC magnetic field vector produced by field windings, energizing the field windings with AC current in a manner that causes an AC magnetic field vector to move around the axis of the rotor and thereby cause the rotor to rotate in synchronization with the movement of the AC magnetic field vector around the axis.

14 ~~13~~. A method as set forth in claim 13 ~~12~~, wherein the rotor is constructed with at least one conductive loop that includes diametrically opposed axially extending portions adjacent the periphery of the rotor so that the AC magnetic field vector is able to induce an AC current in the loop when a plane defined by said axially extending portions is at an angle relative to the AC magnetic field vector.

add a1